

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-264040

(43)Date of publication of application : 19.09.2003

(51)Int.Cl.

H01R 13/648

(21)Application number : 2002-064314

(71)Applicant : AUTO NETWORK GIJUTSU  
KENKYUSHO:KK  
SUMITOMO WIRING SYST LTD  
SUMITOMO ELECTRIC IND LTD

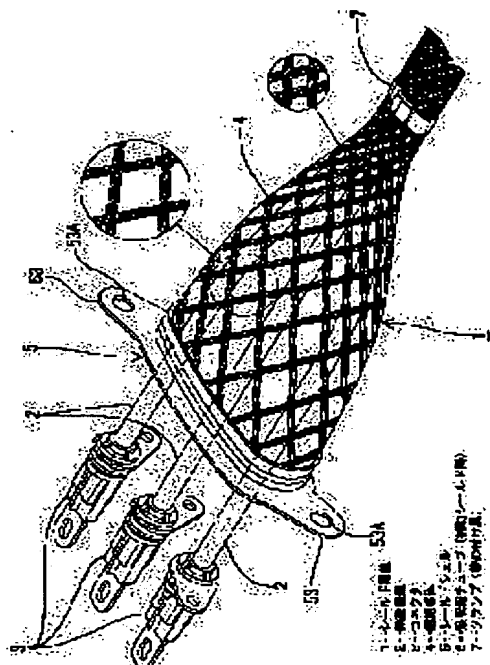
(22)Date of filing : 08.03.2002

(72)Inventor : MIZUTANI YOSHIO

## (54) SHIELD ELECTRIC WIRE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a shield electric wire in which degradation of a shield performance can be prevented.  
**SOLUTION:** A plurality of insulated electric wires 2 provided with a connector 3 which is made possible to be connected with an equipment side terminal at the tip end is integrally surrounded by a single braided conductor 4, fitted to the inner shell 51 by expanding the opening end part 41 and further externally fitted to the outer shell 52. A heat shrinkable tube 6 composed of an electroconductive resin has been mounted on respective insulated electric wires 2 from a connector 3 to a position corresponding to a part in which a knitted loop becomes dense in the braided conductor 4, and the outer periphery of that part is tightened by a clamp 7. In this way, the heat shrinkable tube 6 of the respective insulated electric wires 2 becomes a state of being in contact with the braided conductor 4. In this way, an earthing to a shield case 10 is carried out via the heat shrinkable tube 6, the braided conductor 4 and a shield shell 5 without a noise leaked to the outside from the opening end part 41 where the knitted loop becomes coarse.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] In the shielding electric wire which extends the open end of a conductor and it comes to connect insulated wire -- a tubed braid -- while surrounding with a conductor, it prepares in the terminal section of the insulated wire -- having -- said braid -- shielding shell with a bigger path than a conductor -- said braid -- the inside of said insulated wire -- said braid -- the stitch of a conductor -- rough -- \*\* -- near said shielding shell, an auxiliary shielding layer prepares in an outside surface -- having -- the auxiliary shielding layer -- said braid -- the shielding electric wire characterized by connecting with a conductor electrically.

[Claim 2] the part corresponding to the edge of the opposite side with said shielding shell of said auxiliary shielding layer -- said braid -- the braid from the periphery side of a conductor -- the shielding electric wire according to claim 1 characterized by attaching the bolting implement which maintains a conductor in the contact condition at said auxiliary shielding layer.

[Claim 3] Said auxiliary shielding layer is a shielding electric wire according to claim 1 or 2 characterized by putting and carrying out the heat shrink of the heat-shrinkable tubing which consists of conductive resin to said insulated wire.

[Claim 4] Said auxiliary shielding layer is a shielding electric wire according to claim 1 or 2 characterized by being the thing which winds around said insulated wire the metal tape which has adhesiveness, and it comes to constitute.

---

[Translation done.]

**\* NOTICES \***

**JPO and NCIPi are not responsible for any damages caused by the use of this translation.**

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

**DETAILED DESCRIPTION**

---

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a shielding electric wire.

[0002]

[Description of the Prior Art] For example, two or more electric wires prolonged from other devices are connected to the inverter equipment with which the electric vehicle was equipped, and some which are indicated by JP,11-26093,A are one of things for connecting these shielding electric wires. This makes the mounting hole face the device side edge child who prepared in the shielding case, inserts the connector which fixed at the edge of each electric wire in a mounting hole, respectively, and has the structure of connecting a device side edge child and a connector while carrying out opening of the mounting hole to the shielding case which holds inverter equipment.

[0003] by the way, in order to prevent external leakage of the electric noise generated from inverter equipment etc. on this kind of shielding electric wire, a shielding layer prepares -- having -- \*\*\*\* -- general -- a tubed braid -- the thing which is called a conductor and which may be transformed flexibly is used. moreover, the braid which is easy to deform -- in order to connect a conductor to a shielding case -- each braid -- a conductor -- rigid high shielding shell is attached in a terminal section periphery, this shielding shell is attached in a shielding case, and it is made to contact the case where two or more electric wires are shielded here for reduction of an attachment man day -- these electric wires -- one braid -- it surrounds collectively with a conductor, single shielding shell is attached in an edge, and it is possible to connect this shielding shell to a shielding case. According to this, since shielding shell can be managed with one, it has the advantage that an attachment man day can be decreased.

[0004]

[Problem(s) to be Solved by the Invention] However, a part for the point of each electric wire must be mutually separated from the request on an insulation, and also needs to make shielding shell enlarge in connection with this with this kind of shielding electric wire. Therefore, when attaching shielding shell in the edge of a braided wire, a braid end-of-line tail must be extended, opening must be carried out greatly, a stitch becomes coarse by this and there is a problem that the shielding engine performance may fall.

[0005] This invention is completed based on the above situations, and it aims at offering the shielding connector equipment which can prevent shielding performance degradation.

[0006]

[Means for Solving the Problem] As a means for attaining the above-mentioned purpose, invention of claim 1 In the shielding electric wire which extends the open end of a conductor and it comes to connect insulated wire -- a tubed braid -- while surrounding with a conductor, it prepares in the terminal section of the insulated wire -- having -- said braid -- shielding shell with a bigger path than a conductor -- said braid -- the inside of said insulated wire -- said braid -- the mesh of a conductor -- rough -- \*\* -- near said shielding shell, an auxiliary shielding layer prepares in an outside surface -- having -- the auxiliary shielding layer -- said braid -- it has the description at the place electrically connected to the conductor.

[0007] the part on a thing according to claim 1 and corresponding to [ in invention of claim 2 ] the edge of the opposite side with said shielding shell of said auxiliary shielding layer -- said braid -- the braid from the periphery side of a conductor -- it has the description at the place in which the bolting implement which maintains a conductor in the contact condition at said auxiliary shielding layer is attached.

[0008] Invention of claim 3 has the description in a thing according to claim 1 or 2 at the place which said auxiliary shielding layer puts the heat-shrinkable tubing which consists of conductive resin on said insulated wire, and carries out a heat shrink.

[0009] Invention of claim 4 has the description in a thing according to claim 1 or 2 at the place constituted by said auxiliary shielding layer winding around said insulated wire the metal tape which has adhesiveness. [0010]

[Function and Effect of the Invention] <invention of claim 1, for example, a braid,> -- it is attached in the shielding case which stores inverter equipment through shielding shell in case the electric wire which connects inverter equipment and the motor for power for a conductor is shielded. this condition -- a braid -- since the stitch of a near [ an open end ] will be in the condition that a rough next door and the shielding engine performance fell, among conductors, there is a possibility that the electric noise generated from inverter equipment may be revealed from a stitch. on the other hand -- this invention -- the inside of insulated wire -- a braid -- the stitch of a conductor -- rough -- \*\* -- an auxiliary shielding layer prepares in an outside surface near the shielding shell -- having -- the auxiliary shielding layer -- a braid -- since it connects with the conductor electrically -- an electric noise -- \*\*\*\* -- without it reveals outside from the stitch of a conductor -- an auxiliary shielding layer and \*\*\*\* -- it is grounded by the shielding case with a conductor.

[0011] the auxiliary shielding layer of a <invention of claim 2> electric wire, and a braid -- a conductor is maintained by the contact condition, and although the force from the outside, such as vibration, reaches, since a contact condition is not checked further, it can shield certainly.

[0012] If a <invention of claim 3 and claim 4> auxiliary shielding layer is constituted from heat-shrinkable tubing, since it will be closely attached to insulated wire and there will be neither a location gap nor fault of separating, also to the force from the outside, such as vibration, the certainty of shielding nature increases (invention of claim 3). Moreover, if constituted from a metal tape, it can use widely to the insulated wire which has various paths or die length (invention of claim 4).

[0013]

[Embodiment of the Invention] The shielding electric wire concerning this invention is explained with reference to drawing 1 thru/or drawing 2 below the <1st operation gestalt> about 1 operation gestalt applied to wiring in an electric vehicle. The shielding electric wire 1 is equipped with three insulated wire 2, and it is allotted between the inverter equipment (not shown) which operates the motor for power (not shown), and this motor for power. Moreover, the connector 3 is formed at the tip of the insulated wire 2 with which covering was removed and the core wire was exposed, and it is inserted in the mounting hole 11 of a shielding case 10 in which this stored inverter equipment, and connects with the device side edge child who stands in a row from inverter equipment.

[0014] the tubed braid which surrounds insulated wire 2 collectively in the location which retreated rather than the connector 3 -- the conductor 4 is formed and, as for this, it is possible to make it deform easily. and a connector 3 and a braid -- between conductors 4, the shielding shell 5 which similarly surrounds insulated wire 2 collectively is formed. from the outer shell 52 by which outer fitting is carried out to the inner shell 51 which makes the abbreviation ellipse form where the shielding shell 5 is oblong, and this inner shell 51 -- becoming -- the path of both the shell 51 and 52 -- a braid -- it considers as the thing larger enough than the diameter of opening of a conductor 4. Moreover, the tabular bracket section 53 which has a bolthole is projected and formed in the periphery edge of an inner shell 51 at the longitudinal direction.

[0015] and -- between the periphery of an inner shell 51, and the inner circumference of the outer shell 52 -- a braid -- while the open end 41 of a conductor 4 can extend and is put -- the braid -- where the open end 41 of a conductor 4 is put, both the shell 51 and 52 has fixed by caulking attachment. this -- a braid -- it considers as the condition that the open end 41 and the shielding shell 5 of a conductor 4 can flow. moreover, a braid -- opening of the conductor 4 is carried out to the shape of skirt breadth toward the open end 41, and the stitch is becoming coarse gradually.

[0016] moreover -- each insulated wire 2 -- the motor side for power from a connector 3 -- going -- a braid -- it is attached by putting the heat-shrinkable tubing 6 (equivalent to an auxiliary shielding layer given in a claim) which consists of conductive resin, and making it contract among conductors 4 to the location corresponding to the part the stitch is dense. and the braid corresponding to the edge of this heat-shrinkable tubing 6 -- the periphery of a conductor 4 is bound tight by the metal clamp 7 (equivalent to a bolting implement given in a claim) -- having -- \*\*\*\* -- this -- heat-shrinkable tubing 6 edge and a braid -- a conductor 4 contacts and it is in the condition which can flow.

[0017] Hereafter, the operation of a shielding electric wire and effectiveness concerning the above-mentioned configuration are explained. for connecting a connector 3 to the device side edge child within a shielding case 10 -- beforehand -- a braid -- after letting insulated wire 2 pass to what finished setting up a conductor 4, an inner shell 51, and the outer shell 52, the connector 3 of each insulated wire 2 is inserted in

the mounting hole 11 of a shielding case 10, and it connects with a device side edge child. and a shielding case 10 is contacted in the bracket section 53 of an inner shell 51 -- making -- bolting -- carrying out -- a braid -- the periphery of a conductor 4 -- a clamp 7 -- binding tight -- a braid -- a conductor 4 and the heat shrink cable 6 are contacted.

[0018] if it is in an attachment condition -- a braid -- among conductors 4, since the opening of the open end 41 neighborhood is carried out and the stitch is coarse, this field is in the condition that the shielding engine performance to electrical noise fell. the time of the electric noise generated from devices, such as inverter equipment, attaching here, and revealing from a hole 11 -- the inside of heat-shrinkable tubing 6 -- a clamp 7 -- going -- going on -- a braid -- it is grounded by the shielding case 10 through a conductor 4 and the shielding shell 5.

[0019] thereby -- a braid -- by having attached the conductor 4 to the shielding shell 5, a noise is not revealed from insulated wire 2 as rough \*\*\*\*\*, and a stitch can prevent shielding performance degradation. moreover, an auxiliary shielding layer forms with heat-shrinkable tubing 6 -- having -- \*\*\*\* -- further -- a clamp 7 -- a braid -- the environment by which vibration like an electric vehicle is accompanied since a conductor 4 and heat-shrinkable tubing 6 are bound tight and it is in contact -- also setting -- heat-shrinkable tubing 6 -- insulated wire 2 -- receiving -- causing a location gap \*\*\*\* -- heat-shrinkable tubing 6 and a braid -- the poor contact of a conductor 4 does not occur and the shielding engine performance can be kept good.

[0020] It is as the 2nd operation gestalt of the shielding electric wire concerning <2nd operation gestalt> this invention being shown in drawing 3 , and it is possible to use widely to the insulated wire 2 with which the place which wound the metal tape 8 around insulated wire 2, and constituted it as an auxiliary shielding layer differs from the 1st operation gestalt, and the die length which should form the path and the auxiliary shielding layer of covering differs according to this.

[0021] Within limits which it is not limited to the operation gestalt explained with the above-mentioned description and a drawing, and the following operation gestalten are also included in the technical range of this invention, for example, do not deviate from a summary further besides the following, operation gestalt > this invention besides < can be changed variously, and can be carried out.

(1) the above-mentioned operation gestalt -- the metallicity clamp 7 -- using -- insulated wire 2 and a braid - - although it was the thing which a conductor 5 is put [ thing ] together and makes a contact condition maintain it -- a corrugate tube -- a braid -- a conductor -- a periphery -- covering -- both -- a bundle -- you may carry out -- in short -- a braid -- what is necessary is just to be able to make a contact condition maintain a conductor and an auxiliary shielding layer

[0022] (2) Moreover, although heat-shrinkable tubing 6 was used for the auxiliary shielding layer of insulated wire 2, a metal paste may be applied that what is necessary is just what has conductivity.

[0023] (3) moreover -- the above-mentioned operation gestalt -- heat-shrinkable tubing 6 -- a braid -- although it was made for a stitch to make a dense part contact among conductors 5 -- a braid -- the inside of a conductor 5 -- a stitch -- rough -- the part which is that it is \*\*\*\* may be made to contact, and it may be contacted by the shielding case 10. What is necessary is for whether an auxiliary shielding layer is direct or indirect not to ask in short, but to just come to be grounded.

---

[Translation done.]

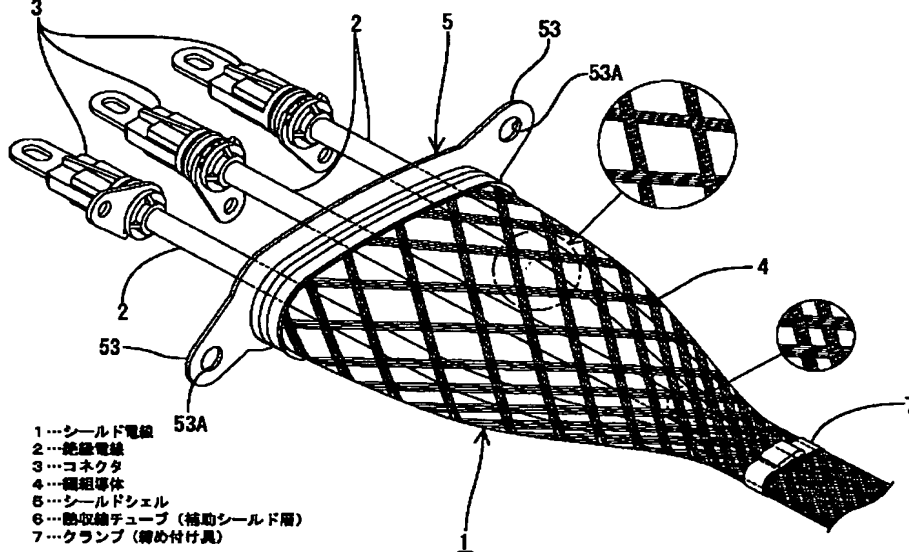
## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

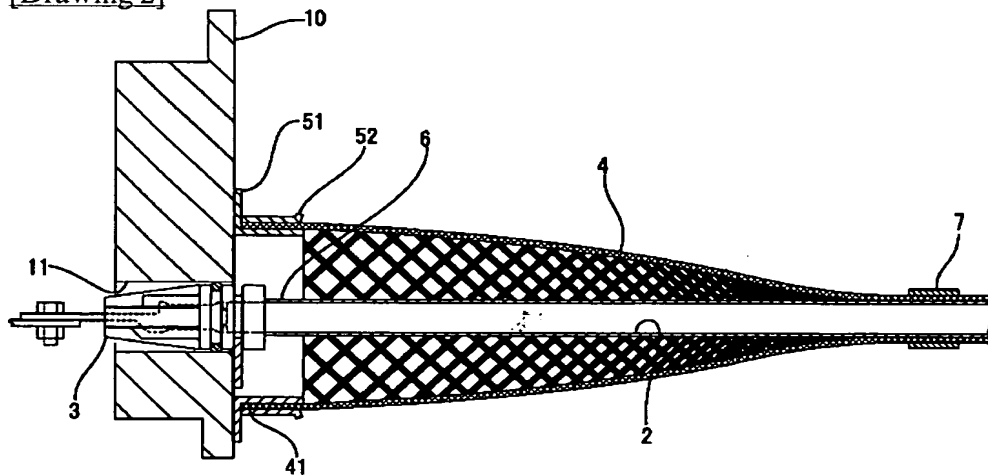
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

## DRAWINGS

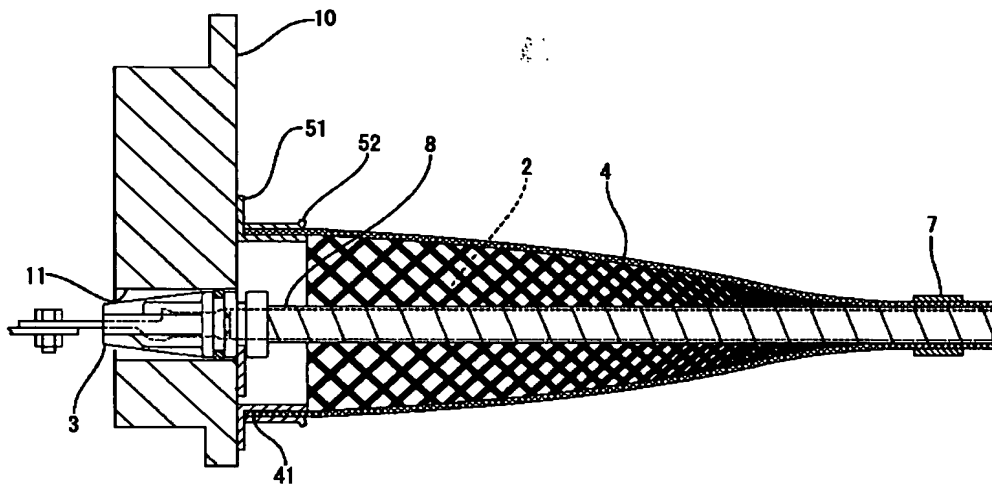
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]